Fact Sheet

UNITED STATES AIR FORCE

377TH AIR BASE WING (AFMC)
Office of Public Affairs, Kirtland Air Force Base, NM 87117 505-846-5991

Introduction to Systems Engineering Flight

In the Air Force Research Laboratory La Luz Academy's Introduction to Systems Engineering Flight, for eighth graders, students learn the basics of Systems Engineering and program small robots called Boe-Bots® to run a series of increasingly challenging obstacle courses, in three nonconsecutive instruction days.

The La Luz Academy is on Kirtland Air Force Base, New Mexico

The curriculum also incorporates teamwork and the Air Force Core Values: Integrity First, Service Before Self, and Excellence in All We Do.

Students are introduced to the concept of a system, and see how the computer is an example of a system. They also explore the history of computers, from relatively simple devices like abacuses and Jacquard looms, to computers that filled a building and on to the desktop computers we have today.

The eighth graders learn how to think like a computer—in binary, using only ones and zeros, and try their hand at some binary math. They then discover how to use a computer to talk to a microcontroller—using the BASIC programming language. They work with units of time that computers deal with, like microseconds and milliseconds; use programming terms like for…next loops and debug commands and create flowcharts to aid the programming process.

Teams build their own Boe-Bot® robot by assembling the following components: a BASIC stamp board, a chassis, servomotors, wheels, a battery pack and various screws, nuts and washers.

Then they use their new programming skills to make the robot do some simple tasks—like flash lights, play music, and move forward or backward—at their command.

Finally, students program their Boe-Bot® to maneuver through a series of increasingly challenging obstacle courses.

On their third instruction day, students demonstrate their programming skills at the Robotics Expo. Volunteers from AFRL and other organizations serve as judges to score the robots as they complete each obstacle course run.

For more information, contact AFRL La Luz Academy at (505) 846-8042
or go to:
http://www.vs.afrl.af.mil/TechOutreach/TT/K-12.aspx

(Current as of October 2008)